MEASUREMENT OF INELASTIC-SCATTERING CROSS SECTIONS IN THE $^{16}O+^{28}Si$ SYSTEM TO DISCRIMINATE REGULAR AND CHAOTIC REGIMES*

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Coupled-channel calculations for inelastic-scattering in systems such as $^{16}O+^{28}Si$ predict distinctive cross section patterns that appear to correspond with the classical occurrence of either regular or chaotic regimes [1]. Each type of behavior should become apparent when examining two-dimensional maps of double-differential cross sections as a function of the bombarding energy and the scattering angle. Previous measurements for the $^{16}O+^{28}Si$ in two energy regions, one close to the Coulomb barrier and the other well above, are in reasonable agreement with the theoretical predictions [2]. However new experiments to extend the angular range of the measurements, and to increase the statistics of the data are required to confirm the initial findings and to further characterize the behavior of the two regimes. We have used a novel technique to obtain angular distributions, that combines the large sensitivity of Gammasphere and the wide angular coverage and efficiency provided by the particle spectrometer CHICO. In this contribution we will discuss the most relevant aspects of the technique and the data analysis procedures. An example of the data is shown in figures 1 and 2. Preliminary results will be presented and compared with theoretical predictions.

[1] C. H. Dasso, G. Pollarolo, M. Saraceno, Nucl. Phys. **A602**, 77 (1996).
[2] G.V. Martí et al Phys. Lett. **B447**, 41 (1999).

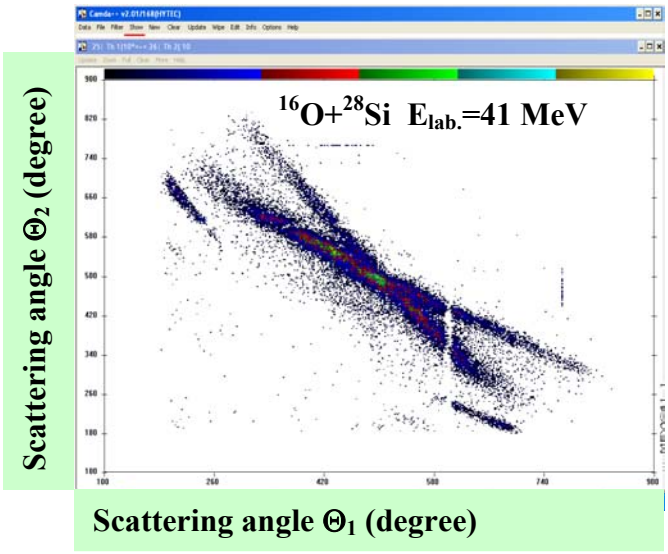

Figure 1: Coincident two-dimensional angular plot obtained for binary reaction products of the system $^{16}O+^{28}Si$ at a bombarding energy of 41 MeV.

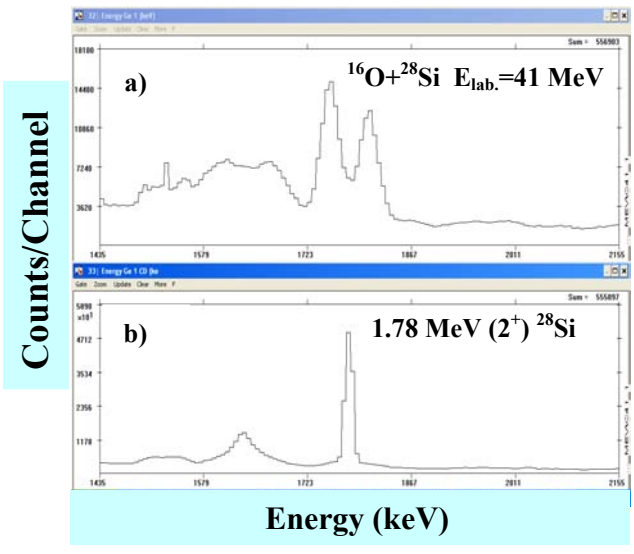

Figure 2: A region of a γ-ray spectrum showing the 1.78 MeV transition de-exciting the 2^+ state in ^{28}Si; before **a)** and after **b)** Doppler shift correction.